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<input type="checkbox"/>	L3	l2 and (Kerr or Kohl).in.	6
<input type="checkbox"/>	L2	pseudopterog\$8 same (cyclas\$4 or synthas\$4)	6
<input type="checkbox"/>	L1	pseudopterog\$4 same (cyclas\$4 or synthas\$4)	0

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## Search Results - Record(s) 1 through 6 of 6 returned.

☐ 1. Document ID: US 20040185532 A1

L2: Entry 1 of 6

File: PGPB

Sep 23, 2004

PGPUB-DOCUMENT-NUMBER: 20040185532

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20040185532 A1

TITLE: Methods and compositions for cyclizing diterpenes

PUBLICATION-DATE: September 23, 2004

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Kerr, Russell G.	Boca Raton	FL	US
Kohl, Amber	Boynton Beach	FL	US

US-CL-CURRENT: [435/69.1](#); [435/193](#), [435/252.3](#), [536/23.2](#)

<a href="#">Full</a>	<a href="#">Title</a>	<a href="#">Citation</a>	<a href="#">Front</a>	<a href="#">Review</a>	<a href="#">Classification</a>	<a href="#">Date</a>	<a href="#">Reference</a>	<a href="#">Sequences</a>	<a href="#">Attachments</a>	<a href="#">Claims</a>	<a href="#">KIMC</a>	<a href="#">Draw Desc</a>	<a href="#">Image</a>
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☐ 2. Document ID: US 20030153052 A1

L2: Entry 2 of 6

File: PGPB

Aug 14, 2003

PGPUB-DOCUMENT-NUMBER: 20030153052

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030153052 A1

TITLE: Diterpene cyclase and methods of use

PUBLICATION-DATE: August 14, 2003

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Kerr, Russell	Boca Raton	FL	US
Kohl, Amber	Boynton Beach	FL	US
Lopez, Jose	Vero Beach	FL	US

US-CL-CURRENT: [435/74](#); [435/156](#), [435/193](#)

<a href="#">Full</a>	<a href="#">Title</a>	<a href="#">Citation</a>	<a href="#">Front</a>	<a href="#">Review</a>	<a href="#">Classification</a>	<a href="#">Date</a>	<a href="#">Reference</a>	<a href="#">Sequences</a>	<a href="#">Attachments</a>	<a href="#">Claims</a>	<a href="#">KIMC</a>	<a href="#">Draw Desc</a>	<a href="#">Image</a>
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☐ 3. Document ID: US 20030104007 A1

L2: Entry 3 of 6

File: PGPB

Jun 5, 2003

PGPUB-DOCUMENT-NUMBER: 20030104007  
PGPUB-FILING-TYPE: new  
DOCUMENT-IDENTIFIER: US 20030104007 A1

TITLE: Pseudopterosin compounds of Symbiodinium spp isolated from Pseudopterogorgia elisabethae

PUBLICATION-DATE: June 5, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Jacobs, Robert S.	Santa Barbara	CA	US
Mydlarz, Laura	Santa Barbara	CA	US
Kerr, Russell G.	Boca Raton	FL	US

US-CL-CURRENT: [424/195.17](#); [514/43](#), [536/27.2](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw Desc	Image
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☐ 4. Document ID: US 6787571 B2

L2: Entry 4 of 6

File: USPT

Sep 7, 2004

US-PAT-NO: 6787571  
DOCUMENT-IDENTIFIER: US 6787571 B2

TITLE: Anti-inflammatory compounds derived from Pseudopterogorgia elisabethae

DATE-ISSUED: September 7, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Jacobs, Robert S.	Santa Barbara	CA		
Kerr, Russell G.	Boca Raton	FL		

US-CL-CURRENT: [514/681](#); [552/296](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw Desc	Image
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☐ 5. Document ID: US 6780622 B2

L2: Entry 5 of 6

File: USPT

Aug 24, 2004

US-PAT-NO: 6780622  
DOCUMENT-IDENTIFIER: US 6780622 B2

TITLE: Diterpene cyclase and methods of use

DATE-ISSUED: August 24, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Kerr, Russell	Boca Raton	FL		

Kohl, Amber

Boynton Beach

FL

US-CL-CURRENT: 435/183; 435/4, 530/350

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw Desc	Image
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☐ 6. Document ID: US 20040185532 A1, WO 2003065001 A2, US 20030153052 A1, AU 2003214905 A1, US 6780622 B2

L2: Entry 6 of 6

File: DWPI

Sep 23, 2004

DERWENT-ACC-NO: 2003-731455

DERWENT-WEEK: 200463

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TITLE: New purified elisabethatriene cyclase protein from coral sample or purified fragment of the protein having diterpene cyclase activity, useful for converting geranyl geranyl diphosphate to elisabethatriene

INVENTOR: KERR, R; KOHL, A ; LOPEZ, J ; KERR, R G

PRIORITY-DATA: 2002US-351984P (January 25, 2002), 2003US-0351766 (January 27, 2003), 2004US-0798191 (March 11, 2004)

## PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
<u>US 20040185532 A1</u>	September 23, 2004		000	C12N009/06
<u>WO 2003065001 A2</u>	August 7, 2003	E	022	G01N000/00
<u>US 20030153052 A1</u>	August 14, 2003		000	C12P019/44
<u>AU 2003214905 A1</u>	September 2, 2003		000	G01N000/00
<u>US 6780622 B2</u>	August 24, 2004		000	C12N009/00

INT-CL (IPC): C07H 21/04; C07K 17/00; C12N 9/00; C12N 9/06; C12N 9/10; C12P 7/22; C12P 19/44; C12Q 1/00; G01N 0/00

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw Desc	Image
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Terms

Documents

pseudopterog\$8 same (cyclas\$4 or synthas\$4)

6

Display Format:  Change Format[Previous Page](#)[Next Page](#)[Go to Doc#](#)

=> d his full

(FILE 'HOME' ENTERED AT 10:26:05 ON 09 NOV 2006)

INDEX 'ADISCTI, ADISINSIGHT, ADISNEWS, AGRICOLA, ANABSTR, ANTE, AQUALINE, AQUASCI, BIOENG, BIOSIS, BIOTECHABS, BIOTECHDS, BIOTECHNO, CABA, CAPLUS, CEABA-VTB, CIN, CONFSCI, CROPB, CROPU, DDFB, DDFU, DGENE, DISSABS, DRUGB, DRUGMONOG2, DRUGU, EMBAL, EMBASE, ...' ENTERED AT 10:28:40 ON 09 NOV 2006  
SEA PSEUDOPTEROG?(S)(CYCLAS? OR SYNTHAS?)

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1 FILE AQUASCI  
2 FILE BIOENG  
3 FILE BIOSIS  
1 FILE BIOTECHABS  
1 FILE BIOTECHDS  
1 FILE BIOTECHNO  
7 FILE CAPLUS  
1 FILE CEABA-VTB  
4 FILE DGENE  
3 FILE EMBASE  
4 FILE ESBIODBASE  
3 FILE IFIPAT  
2 FILE LIFESCI  
2 FILE MEDLINE  
1 FILE OCEAN  
2 FILE PASCAL  
3 FILE SCISEARCH  
3 FILE USPATFULL  
1 FILE USPAT2  
1 FILE WPIDS  
1 FILE WPINDEX  
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L1 QUE PSEUDOPTEROG?(S)(CYCLAS? OR SYNTHAS?)

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FILE 'CAPLUS, ESBIODBASE, BIOSIS, EMBASE, IFIPAT, SCISEARCH, USPATFULL, BIOENG, LIFESCI, MEDLINE' ENTERED AT 10:29:35 ON 09 NOV 2006

L2 32 SEA PSEUDOPTEROG?(S)(CYCLAS? OR SYNTHAS?)  
L3 11 DUP REM L2 (21 DUPLICATES REMOVED)  
D TI L3 1-11  
D IBIB ABS L3 1-11

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NEWS 7 SEP 21 CA/CAplus fields enhanced with simultaneous left and right  
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NEWS 8 SEP 25 CA(SM)/CAplus(SM) display of CA Lexicon enhanced  
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NEWS 10 SEP 25 CAS REGISTRY(SM) updated with amino acid codes for pyrrolysine  
NEWS 11 SEP 28 CEABA-VTB classification code fields reloaded with new  
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NEWS 13 OCT 19 E-mail format enhanced  
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has been enhanced and reloaded  
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NEWS EXPRESS JUNE 30 CURRENT WINDOWS VERSION IS V8.01b, CURRENT  
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=> s pseudopterog?(s)(cyclas? or synthas?)

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=> index bioscience medicine

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COST IN U.S. DOLLARS

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TOTAL

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0.84

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L1 QUE PSEUDOPTEROG?(S) (CYCLAS? OR SYNTHAS?)

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F1 7 CAPLUS  
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F3 4 ESBIODBASE  
F4 3 BIOSIS  
F5 3 EMBASE  
F6 3 IFIPAT  
F7 3 SCISEARCH  
F8 3 USPATFULL  
F9 2 BIOENG  
F10 2 LIFESCI  
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F13 1 AQUASCI  
F14 1 BIOTECHABS  
F15 1 BIOTECHDS

F16	1	BIOTECHNO
F17	1	CEABA-VTB
F18	1	OCEAN
F19	1	USPAT2
F20	1	WPIDS
F21	1	WPINDEX
F22	1	NAPRALERT

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TOTAL

ENTRY

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2.06

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=> s pseudopterog?(s) (cyclas? or synthas?)

L2 32 PSEUDOPTEROG?(S) (CYCLAS? OR SYNTHAS?)

=> dup rem l2

PROCESSING COMPLETED FOR L2

L3 11 DUP REM L2 (21 DUPLICATES REMOVED)

=> d ti l3 1-11

L3 ANSWER 1 OF 11 Elsevier BIOBASE COPYRIGHT 2006 Elsevier Science B.V. on STN

TI Elucidation of the biosynthetic origin of the anti-inflammatory pseudopterogens

L3 ANSWER 2 OF 11 CAPLUS COPYRIGHT 2006 ACS on STN DUPLICATE 1

TI Purification and kinetic properties of elisabethatriene synthase from the coral Pseudopterogorgia elisabethae

L3 ANSWER 3 OF 11 CAPLUS COPYRIGHT 2006 ACS on STN DUPLICATE 2



TI Pseudopterogorgia elisabethae diterpene cyclase and its purification

L3 ANSWER 4 OF 11 IFIPAT COPYRIGHT 2006 IFI on STN  
 TI DITERPENE CYCLASE AND METHODS OF USE; ENZYME CATALYZED THE CYCLIZATION OF GERANYL GERANYL DIPHOSPHATE TO ELISABETHATRIENE

L3 ANSWER 5 OF 11 CAPLUS COPYRIGHT 2006 ACS on STN DUPLICATE 3  
 TI Identification and characterization of the pseudopterodin diterpene cyclase, elisabethatriene synthase, from the marine gorgonian, Pseudopterogorgia elisabethae

L3 ANSWER 6 OF 11 IFIPAT COPYRIGHT 2006 IFI on STN DUPLICATE 4  
 TI DITERPENE CYCLASE AND METHODS OF USE; ENZYME CATALYZED THE CYCLIZATION OF GERANYL GERANYL DIPHOSPHATE TO ELISABETHATRIENE

L3 ANSWER 7 OF 11 CAPLUS COPYRIGHT 2006 ACS on STN  
 TI Purification and characterization of elisabethatriene cyclase from Pseudopterogorgia elisabethae and use for production of elisabethatriene

L3 ANSWER 8 OF 11 USPATFULL on STN  
 TI Pseudopterodin compounds of Symbiodinium spp isolated from Pseudopterogorgia elisabethae

L3 ANSWER 9 OF 11 CAPLUS COPYRIGHT 2006 ACS on STN DUPLICATE 5  
 TI Pseudopterodin biosynthesis-pathway elucidation, enzymology, and a proposed production method for anti-inflammatory metabolites from Pseudopterogorgia elisabethae

L3 ANSWER 10 OF 11 CAPLUS COPYRIGHT 2006 ACS on STN  
 TI Pseudopterodin biosynthesis: aromatization of the diterpene cyclase product, elisabethatriene

L3 ANSWER 11 OF 11 CAPLUS COPYRIGHT 2006 ACS on STN DUPLICATE 6  
 TI Radioactivity-guided isolation and characterization of the bicyclic pseudopterodin diterpene cyclase product from Pseudopterogorgia elisabethae

=> d ibib abs l3 1-11

L3 ANSWER 1 OF 11 Elsevier BIOBASE COPYRIGHT 2006 Elsevier Science B.V. on STN

ACCESSION NUMBER: 2006165556 ESBIODASE

TITLE: Elucidation of the biosynthetic origin of the anti-inflammatory pseudopterodins

AUTHOR: Kerr R.G.; Kohl A.C.; Ferns T.A.

CORPORATE SOURCE: R.G. Kerr, Department of Chemistry and Biochemistry, Center of Excellence in Biomedical and Marine Biotechnology, Florida Atlantic University, Boca Raton, FL 33431, United States.  
 E-mail: rkerr@fau.edu

SOURCE: Journal of Industrial Microbiology and Biotechnology, (2006), 33/7 (532-538), 36 reference(s)  
 CODEN: JIMBFL ISSN: 1367-5435 E-ISSN: 1476-5535

DOCUMENT TYPE: Journal; Conference Article

COUNTRY: Germany, Federal Republic of

LANGUAGE: English

SUMMARY LANGUAGE: English

AB The pseudopterodins are a family of diterpene glycosides isolated from the gorgonian coral Pseudopterogorgia elisabethae. These metabolites exhibit potent anti-inflammatory activity, and this review describes our efforts to elucidate their biosynthetic origin. A radioactivity-guided isolation was used to identify the terpene

cyclase product. In addition, a detailed NMR-guided search for potential biosynthetic intermediates identified metabolites which were tested by incubating <sup>3</sup>H-labeled analogues with a cell-free extract of the coral. All labeled metabolites were generated biosynthetically, and radiochemical purity was established by a combination of HPLC purification and derivatization. In summary, pseudopterogens are produced by a cyclization of geranylgeranyl diphosphate to elisabethatriene, aromatization to erogorgiaene, two successive oxidations to 7,8-dihydroxyerogorgiaene and a glycosylation to afford a seco-pseudopterogen as a key intermediate. A dehydrogenation leads to amphilectosins which undergo ring closures to yield the pseudopterogens. .COPYRGHT. Society for Industrial Microbiology 2006.

L3 ANSWER 2 OF 11 CAPLUS COPYRIGHT 2006 ACS on STN DUPLICATE 1

ACCESSION NUMBER: 2006:183524 CAPLUS

DOCUMENT NUMBER: 145:309041

TITLE: Purification and kinetic properties of elisabethatriene synthase from the coral Pseudopterogorgia elisabethae

AUTHOR(S): Brueck, Thomas B.; Kerr, Russell G.

CORPORATE SOURCE: Center of Excellence in Biomedical and Marine Biotechnology, Department of Chemistry and Biochemistry, Florida Atlantic University, Boca Raton, FL, 33431, USA

SOURCE: Comparative Biochemistry and Physiology, Part B: Biochemistry & Molecular Biology (2006), 143B(3), 269-278

CODEN: CBPBB8; ISSN: 1096-4959

PUBLISHER: Elsevier B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The Bahamian octocoral Pseudopterogorgia elisabethae is the source of pseudopterogens, diterpene glycosides with potent anti-inflammatory activity. The first committed step in pseudopterogen biosynthesis comprises the cyclization of the universal diterpene precursor geranylgeranyl diphosphate to elisabethatriene. This reaction is catalyzed by elisabethatriene synthase, which was purified to homogeneity from a crude coral extract. This represents the first purification to apparent homogeneity of a terpene cyclase from any marine source. The reaction kinetics of elisabethatriene synthase was examined using a steady state approach with <sup>3</sup>H-labeled isoprenyldiphosphates varying in carbon chain length (C10, C15, C20). For the reaction of elisabethatriene synthase with its natural substrate geranylgeranyl diphosphate, values of  $K_m$  ( $2.3 \times 10^{-6}$  M),  $V_{max}$  ( $3.4 \times 10^4$  nM elisabethatriene<sup>-1</sup> s<sup>-1</sup>) and the specificity constant ( $k_{cat}/K_m = 1.8 \times 10^{10}$  M<sup>-1</sup> s<sup>-1</sup>) were comparable with diterpene cyclases from terrestrial plants. Elisabethatriene synthase also catalyzed the conversion of C15 and C10 isoprenyldiphosphate analogs to monoterpene and sesquiterpene olefins, resp. Kinetic parameters indicated that substrate specificity and  $K_m$  of elisabethatriene synthase decreased with decreasing isoprenoid carbon chain length. Furthermore, GC-MS anal. showed increased product diversity with decreasing isoprenoid carbon chain length.

REFERENCE COUNT: 44 THERE ARE 44 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 3 OF 11 CAPLUS COPYRIGHT 2006 ACS on STN DUPLICATE 2

ACCESSION NUMBER: 2004:780258 CAPLUS

DOCUMENT NUMBER: 141:291224

TITLE: Pseudopterogorgia elisabethae diterpene cyclase and its purification

INVENTOR(S): Kerr, Russell G.; Kohl, Amber

PATENT ASSIGNEE(S): USA

SOURCE: U.S. Pat. Appl. Publ., 12 pp., Cont.-in-part of U.S. Pat. Appl. 2003 153,052.

CODEN: USXXCO

DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 2  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004185532	A1	20040923	US 2004-798191	20040311
US 2003153052	A1	20030814	US 2003-351766	20030127
US 6780622	B2	20040824		

PRIORITY APPLN. INFO.: US 2002-351984P P 20020125  
US 2003-351766 A2 20030127

AB The invention provides sequences of novel peptides of a diterpene cyclase from *Pseudopterogorgia elisabethae*. The purified enzyme has an apparent mol. weight of about 47 kilodaltons and an isoelec. point of about 5.1. The purified enzyme catalyzed the cyclization of geranyl geranyl diphosphate to elisabethatriene.

L3 ANSWER 4 OF 11 IFIPAT COPYRIGHT 2006 IFI on STN

AN 04116795 IFIPAT;IFIUDB;IFICDB  
TITLE: DITERPENE CYCLASE AND METHODS OF USE; ENZYME  
CATALYZED THE CYCLIZATION OF GERANYL GERANYL  
DIPHOSPHATE TO ELISABETHATRIENE

INVENTOR(S): Kerr; Russell, Boca Raton, FL, US  
Kohl; Amber, Boynton Beach, FL, US  
PATENT ASSIGNEE(S): Florida Atlantic University, Boca Raton, FL, US  
PRIMARY EXAMINER: Prouty, Rebecca  
ASSISTANT EXAMINER: Ramirez, Delia M  
AGENT: Akerman Senterfitt  
Kim, Stanley A.

	NUMBER	PK	DATE
PATENT INFORMATION:	US 6780622	B2	20040824
	US 2003153052	A1	20030814
APPLICATION INFORMATION:	US 2003-351766		20030127
EXPIRATION DATE:	27 Jan 2023		

	NUMBER	DATE
PRIORITY APPLN. INFO.:	US 2002-351984P	20020125 (Provisional)
FAMILY INFORMATION:	US 6780622	20040824
	US 2003153052	20030814
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	Granted Patent - Utility, with Pre-Grant Publication	
	CHEMICAL	
	GRANTED	

PARENT CASE DATA:

The present application claims the priority of U.S. provisional application No. 60/351,984 filed Jan. 25, 2002.

NOTE: INDEXED FROM APPLICATION  
Subject to any Disclaimer, the term of this patent is extended or adjusted under 35 USC 154(b) by 34 days.

MICROFILM REEL NO: 013980 FRAME NO: 0288  
013980 0308

NUMBER OF CLAIMS: 8  
GRAPHICS INFORMATION: 4 Drawing Sheet(s), 4 Figure(s).

DESCRIPTION OF FIGURES:

FIG. 1 is a schematic overview of pseudopterogorgia/secopseudopterogorgia biosynthesis pathways.

FIG. 2 is sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDS-PAGE) analysis of chromatography fractions. Lane: 1) Low Molecular Weight Standard,

2) Cell-Free Extract, 3) Ion Exchange, 4) Dye Ligand, 5) Hydroxyapatite, 6) Purified Gel Slice.

FIG. 3 is a schematic overview of the chemical transformation of elisabethatriene to elisabethadione.

FIG. 4 is a set of amino acid sequences (SEQ ID NOs:1-4) corresponding to elisabethatriene cyclase peptide fragments purified from *P. elisabethae*.

AB An enzyme having diterpene cyclase activity has been purified from *P. elisabethae* using a series of chromatography steps. The purified enzyme has an apparent molecular weight of about 47 kilodaltons and an isoelectric point of about 5.1. The purified enzyme catalyzed the cyclization of geranyl geranyl diphosphate to elisabethatriene.

NTE INDEXED FROM APPLICATION

Subject to any Disclaimer, the term of this patent is extended or adjusted under 35 USC 154(b) by 34 days.

CLMN 8

GI 4 Drawing Sheet(s), 4 Figure(s).

FIG. 1 is a schematic overview of pseudopteroin/secopseudopteroin biosynthesis pathways.

FIG. 2 is sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDS-PAGE) analysis of chromatography fractions. Lane: 1) Low Molecular Weight Standard, 2) Cell-Free Extract, 3) Ion Exchange, 4) Dye Ligand, 5) Hydroxyapatite, 6) Purified Gel Slice.

FIG. 3 is a schematic overview of the chemical transformation of elisabethatriene to elisabethadione.

FIG. 4 is a set of amino acid sequences (SEQ ID NOs:1-4) corresponding to elisabethatriene cyclase peptide fragments purified from *P. elisabethae*.

L3 ANSWER 5 OF 11 CAPLUS COPYRIGHT 2006 ACS on STN DUPLICATE 3

ACCESSION NUMBER: 2004:190620 CAPLUS

DOCUMENT NUMBER: 140:402179

TITLE: Identification and characterization of the pseudopteroin diterpene cyclase, elisabethatriene synthase, from the marine gorgonian, *Pseudopterogorgia elisabethae*

AUTHOR(S): Kohl, Amber C.; Kerr, Russell G.

CORPORATE SOURCE: Department of Chemistry and Biochemistry and Center of Excellence in Biomedical and Marine Biotechnology, Florida Atlantic University, Boca Raton, FL, 33431, USA

SOURCE: Archives of Biochemistry and Biophysics (2004), 424(1), 97-104

CODEN: ABBIA4; ISSN: 0003-9861

PUBLISHER: Elsevier Science

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The pseudopteroinins are diterpene glycosides isolated from *P. elisabethae*, which exhibit anti-inflammatory and analgesic activity greater than the industry standard, indomethacin. Previously, the authors isolated the pseudopteroin diterpene cyclase product, elisabethatriene, using a radioactivity-guided isolation. Identification of this metabolite, and the conversion of labeled geranylgeranyl diphosphate to elisabethatriene, provided the authors with an assay to guide the isolation of the enzyme responsible for this cyclization. Here, the soluble protein preparation from

*P. elisabethae* was partially purified (.apprx.15,000-fold) using a combination of low-resolution anion-exchange, low-resolution hydrophobic-interaction, high-resolution hydroxylapatite, and high-resolution anion-exchange chromatogs. The diterpene cyclase was identified by comparing the mol. weight from gel permeation chromatog. (.apprx.47 kDa) with those of protein bands from purified fractions using SDS-PAGE. Kinetic anal. and evaluation of amino acid inhibition studies indicated that the enzyme displayed similar characteristics to other terpenoid cyclases isolated from terrestrial sources. This report represents the 1st purification and characterization of a terpene biosynthetic enzyme from a marine invertebrate.

REFERENCE COUNT: 31 THERE ARE 31 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 6 OF 11 IFIPAT COPYRIGHT 2006 IFI on STN DUPLICATE 4  
AN 10408630 IFIPAT;IFIUDB;IFICDB  
TITLE: DITERPENE CYCLASE AND METHODS OF USE; ENZYME  
CATALYZED THE CYCLIZATION OF GERANYL GERANYL  
DIPHOSPHATE TO ELISABETHATRIENE  
INVENTOR(S): Kerr; Russell, Boca Raton, FL, US  
Kohl; Amber, Boynton Beach, FL, US  
Lopez; Jose, Vero Beach, FL, US  
PATENT ASSIGNEE(S): Unassigned  
PATENT ASSIGNEE PROBABLE: Florida Atlantic University (Probable)  
AGENT: Stanley A. Kim, Ph.D., Esq. Akerman Senterfitt, Suite  
400, 222 Lakeview Avenue, West Palm Beach, FL,  
33402-3188, US

	NUMBER	PK	DATE
PATENT INFORMATION:	US 2003153052	A1	20030814
APPLICATION INFORMATION:	US 2003-351766		20030127

	NUMBER	DATE
PRIORITY APPLN. INFO.:	US 2002-351984P	20020125 (Provisional)
FAMILY INFORMATION:	US 2003153052	20030814
	US 6780622	20040824
DOCUMENT TYPE:	Utility	
	Patent Application - First Publication	
FILE SEGMENT:	CHEMICAL	
	APPLICATION	

PARENT CASE DATA:

The present application claims the priority of U.S. provisional application No. 60/351,984 filed Jan. 25, 2002.

NUMBER OF CLAIMS: 16 4 Figure(s).  
DESCRIPTION OF FIGURES:

FIG. 1 is a schematic overview of pseudopteroin/secopseudopteroin biosynthesis pathways.

FIG. 2 is sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDS-PAGE) analysis of chromatography fractions. Lane: 1) Low Molecular Weight Standard, 2) Cell-Free Extract, 3) Ion Exchange, 4) Dye Ligand, 5) Hydroxyapatite, 6) Purified Gel Slice.

FIG. 3 is a schematic overview of the chemical transformation of elisabethatriene to elisabethadione.

FIG. 4 is a set of amino acid sequences (SEQ ID NOs:1-4) corresponding to elisabethatriene cyclase peptide fragments purified from P. elisabethae.

AB An enzyme having diterpene cyclase activity has been purified from P. elisabethae using a series of chromatography steps. The purified enzyme has an apparent molecular weight of about 47 kilodaltons and an isoelectric point of about 5.1. The purified enzyme catalyzed the cyclization of geranyl geranyl diphosphate to elisabethatriene.

CLMN 16 4 Figure(s).

FIG. 1 is a schematic overview of pseudopteroin/secopseudopteroin biosynthesis pathways.

FIG. 2 is sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDS-PAGE) analysis of chromatography fractions. Lane: 1) Low Molecular Weight Standard, 2) Cell-Free Extract, 3) Ion Exchange, 4) Dye Ligand, 5) Hydroxyapatite, 6) Purified Gel Slice.

FIG. 3 is a schematic overview of the chemical transformation of elisabethatriene to elisabethadione.

FIG. 4 is a set of amino acid sequences (SEQ ID NOs:1-4) corresponding to elisabethatriene cyclase peptide fragments purified from P. elisabethae.

L3 ANSWER 7 OF 11 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2003:610730 CAPLUS

DOCUMENT NUMBER: 139:161501

TITLE: Purification and characterization of elisabethatriene cyclase from Pseudopterogorgia elisabethae and use for production of elisabethatriene

INVENTOR(S): Kerr, Russell; Kohl, Amber; Lopez, Jose

PATENT ASSIGNEE(S): Florida Atlantic University, USA

SOURCE: PCT Int. Appl., 22 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 2

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003065001	A2	20030807	WO 2003-US2299	20030127
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW			
RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			

PRIORITY APPLN. INFO.: US 2002-351984P P 20020125

AB An enzyme having diterpene cyclase activity has been purified from Pseudopterogorgia elisabethae using a series of chromatog. steps. The purified enzyme has an apparent mol. weight of about 47 kilodaltons and an isoelec. point of about 5.1. The purified enzyme catalyzed the cyclization of geranyl geranyl diphosphate to elisabethatriene. The invention provides a method for cyclizing geranyl geranyl diphosphate for production of elisabethatriene. The elisabethatriene thus formed can be used as a substrate to produce other mols. involved in pseudopterosin synthesis, such as elisabethadiol, pseudopterosin aglycon, and pseudopterosin A.

L3 ANSWER 8 OF 11 USPATFULL on STN

ACCESSION NUMBER: 2003:152341 USPATFULL

TITLE: Pseudopterosin compounds of Symbiodinium spp isolated from Pseudopterogorgia elisabethae

INVENTOR(S): Jacobs, Robert S., Santa Barbara, CA, UNITED STATES

Mydlarz, Laura, Santa Barbara, CA, UNITED STATES

Kerr, Russell G., Boca Raton, FL, UNITED STATES

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2003104007	A1	20030605
APPLICATION INFO.:	US 2002-264026	A1	20021004 (10)

	NUMBER	DATE
PRIORITY INFORMATION:	US 2001-327028P	20011005 (60)
	US 2001-340833P	20011219 (60)

DOCUMENT TYPE: Utility

FILE SEGMENT: APPLICATION

LEGAL REPRESENTATIVE: Suzannah K. Sundby, Esq., Jacobson Holman PLLC, The Jenifer Building, 400 Seventh Street, N.W., Washington, DC, 20004

NUMBER OF CLAIMS: 35

EXEMPLARY CLAIM: 1

NUMBER OF DRAWINGS: 3 Drawing Page(s)

LINE COUNT: 1560

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB Disclosed herein are pseudopterosin compounds obtained from Symbiodinium spp. symbionts. Also disclosed are methods of obtaining, isolating, purifying or preparing at least one pseudopterosin compound comprising obtaining, isolating, purifying or preparing the pseudopterosin compound from at least one Symbiodinium spp. symbiont. In preferred embodiments, the host is Pseudopteroergorgia, preferably, *P. elisabethae*. As disclosed, preferred pseudopterosin compounds and pseudopterosin compositions are of non-animal origin, substantially free of animal impurities, or both. Treatment methods using the pseudopterosin compounds and compositions are also disclosed.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L3 ANSWER 9 OF 11 CAPLUS COPYRIGHT 2006 ACS on STN DUPLICATE 5

ACCESSION NUMBER: 2003:694125 CAPLUS

DOCUMENT NUMBER: 140:214301

TITLE: Pseudopterosin biosynthesis-pathway elucidation, enzymology, and a proposed production method for anti-inflammatory metabolites from Pseudopteroergorgia elisabethae

AUTHOR(S): Kohl, Amber C.; Ata, Athar; Kerr, Russell G.

CORPORATE SOURCE: Department of Chemistry and Biochemistry and Center for Molecular Biology and Biotechnology, Florida Atlantic University, Boca Raton, FL, USA

SOURCE: Journal of Industrial Microbiology & Biotechnology (2003), 30(8), 495-499

CODEN: JIMBFL; ISSN: 1367-5435

PUBLISHER: Springer-Verlag

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The pseudopterosins are a family of diterpene pentosides isolated from the marine octocoral, Pseudopteroergorgia elisabethae. These compds. possess non-steroidal anti-inflammatory and analgesic properties which have been shown to be greater than the industry standard, indomethacin. In our investigations, we are interested in examining the biosynthesis and enzymol. of these compds. for the development of a biotechnol. production method. We have isolated the pseudopterosin diterpene cyclase product, elisabethatriene, using a radioactivity-guided isolation. This has provided us with an assay to isolate the diterpene cyclase enzyme. The amino acid sequence of the purified diterpene cyclase will facilitate cloning and expression of the gene in a suitable host. In addition, we have identified over 25 novel diterpenes from one of our collections of *P. elisabethae*. Several of these compds. appear to be involved in pseudopterosin biosynthesis and are presently being evaluated as potential intermediates. These compds. have also been evaluated for anti-inflammatory activity and some possess greater activity than that of the pseudopterosins. We therefore propose a production method utilizing a combination of recombinant enzyme technol. and synthetic methods/biocatalysis in order to produce one or more anti-inflammatory metabolites in *P. elisabethae*.

REFERENCE COUNT: 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 10 OF 11 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:273235 CAPLUS

DOCUMENT NUMBER: 141:103435

TITLE: Pseudopterosin biosynthesis: aromatization of the diterpene cyclase product, elisabethatriene

AUTHOR(S): Kohl, Amber C.; Kerr, Russell G.

CORPORATE SOURCE: Department of Chemistry and Biochemistry, Center of Excellence in Biomedical and Marine Biotechnology, Florida Atlantic University, Boca Raton, FL, 33431,

SOURCE: USA  
Marine Drugs (2003), 1(1), 54-65  
CODEN: MDARE6; ISSN: 1660-3397  
URL: http://www.mdpi.net/marinedrugs/papers/papers03/m  
d101054.pdf  
PUBLISHER: MDPI Center  
DOCUMENT TYPE: Journal; (online computer file)  
LANGUAGE: English  
AB Putative precursors in pseudopterosin biosynthesis, the hydrocarbons  
isoelisabethatriene and erogorgiaene, have been identified from an extract of  
Pseudopteroergorgia elisabethae collected in the Florida Keys. Biosynthetic  
expts. designed to test the utilization of these compds. in pseudopterosin  
production revealed that erogorgiaene is transformed to pseudopterosins A-D.  
Together with our previous data, it is now apparent that early steps in  
pseudopterosin biosynthesis involve the cyclization of geranylgeranyl  
diphosphate to elisabethatriene followed by the dehydrogenation and  
aromatization to erogorgiaene.  
REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 11 OF 11 CAPLUS COPYRIGHT 2006 ACS on STN DUPLICATE 6  
ACCESSION NUMBER: 2000:832490 CAPLUS  
DOCUMENT NUMBER: 134:292963  
TITLE: Radioactivity-guided isolation and characterization of  
the bicyclic pseudopterosin diterpene cyclase  
product from Pseudopteroergorgia elisabethae  
AUTHOR(S): Coleman, A. C.; Kerr, R. G.  
CORPORATE SOURCE: Center for Molecular Biology and Biotechnology,  
Department of Chemistry and Biochemistry, Florida  
Atlantic University, Boca Raton, FL, 33431, USA  
SOURCE: Tetrahedron (2000), 56(49), 9569-9574  
CODEN: TETRAB; ISSN: 0040-4020  
PUBLISHER: Elsevier Science Ltd.  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
AB The intermediate representing the first committed step in the  
pseudopterosin biosynthetic pathway has been discovered using a  
radioactivity-guided isolation. This diterpene cyclase product  
was identified from a cell-free extract of the marine soft coral,  
Pseudopteroergorgia elisabethae, which was incubated with  
3H-geranylgeranyl diphosphate. Structural studies of the compound have  
revealed an unexpected bicyclic skeleton suggesting that the  
pseudopterosins are related to the seco-pseudopterosins through a common  
bicyclic intermediate. In addition, the intermediacy of this metabolite in  
pseudopterosin biosynthesis has been confirmed utilizing a cell-free extract  
of P. elisabethae.  
REFERENCE COUNT: 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

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INDEX 'ADISCTI, ADISINSIGHT, ADISNEWS, AGRICOLA, ANABSTR, ANTE, AQUALINE,  
AQUASCI, BIOENG, BIOSIS, BIOTECHABS, BIOTECHDS, BIOTECHNO, CABA, CAPLUS,  
CEABA-VTB, CIN, CONFSCI, CROPB, CROPU, DDFB, DDFU, DGENE, DISSABS, DRUGB,  
DRUGMONOG2, DRUGU, EMBAL, EMBASE, ...' ENTERED AT 10:28:40 ON 09 NOV 2006  
SEA PSEUDOPTEROG?(S) (CYCLAS? OR SYNTHAS?)

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1 FILE AQUASCI  
2 FILE BIOENG  
3 FILE BIOSIS  
1 FILE BIOTECHABS  
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1 FILE BIOTECHNO  
7 FILE CAPLUS  
1 FILE CEABA-VTB  
4 FILE DGENE  
3 FILE EMBASE  
4 FILE ESBIODBASE  
3 FILE IFIPAT  
2 FILE LIFESCI  
2 FILE MEDLINE  
1 FILE OCEAN  
2 FILE PASCAL  
3 FILE SCISEARCH  
3 FILE USPATFULL  
1 FILE USPAT2  
1 FILE WPIDS  
1 FILE WPINDEX  
1 FILE NAPRALERT  
L1 QUE PSEUDOPTEROG?(S) (CYCLAS? OR SYNTHAS?)

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BIOENG, LIFESCI, MEDLINE' ENTERED AT 10:29:35 ON 09 NOV 2006

L2 32 SEA PSEUDOPTEROG?(S) (CYCLAS? OR SYNTHAS?)  
L3 11 DUP REM L2 (21 DUPLICATES REMOVED)  
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D IBIB ABS L3 1-11

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